

REMARKS

This paper is being provided in response to the Office Action mailed June 13, 2003, for the above-referenced application. In this response, Applicant has amended claim 22 to clarify that which Applicant considers to be the invention. Applicant respectfully submits that the amendments to the claims are fully supported by the originally-filed specification.

The rejection of claims 22 and 27-28 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,456,945 to McMillan et al. (hereinafter "McMillan") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

Independent claim 22, as amended herein, recites a method of spin-coating a semiconductor substrate. A coating material is dropped onto the semiconductor substrate and the semiconductor substrate is rotated about its center. An electric field is generated circumferentially around the semiconductor substrate and the coating material in which the electric field has an electric polarity that is opposite to an electric polarity of the coating material. The electric field is generated by electrodes positioned circumferentially around the semiconductor substrate and wherein said electrodes are rotatable about said center of said semiconductor substrate separately from rotation of said semiconductor substrate. Claims 23-28 depend directly or indirectly from independent claim 22.

The McMillan reference discloses a coating process in which an input nozzle provides a coating mist to a substrate and a DC bias is created between a substrate holder and barrier plate to deposit material onto the substrate.

Applicant's independent claim 22 recites at least the feature that an electric field is generated circumferentially around the semiconductor substrate *by at least one electrode positioned circumferentially around said semiconductor substrate, and wherein the at least one electrode is rotatable about said center of said semiconductor substrate separately from rotation of the semiconductor substrate.* Applicant has found that by designing the electrode rotatable about the semiconductor substrate as well as designing the semiconductor substrate rotatable (by means of a rotary table) it is possible to cancel a difference in an intensity of an electric field among regions of the electric field, ensuring generation of an electric field having uniform intensity. (See page 6, lines 18-23).

Applicant respectfully submits that McMillan does not does teach or fairly suggest at least the above features. Specifically, McMillan does not disclose generating an electric field circumferentially around the semiconductor substrate and coating material, wherein the electric field is generated by at least one electrode positioned circumferentially around the semiconductor substrate. Further, McMillan does not disclose at least one electrode that is rotatable around the center of the semiconductor substrate separately from rotation of the semiconductor substrate, as is claimed by Applicant. McMillan discloses a small semi-enclose deposition area in which the *barrier plate 6 is positioned above the substrate holder 4* wherein a DC bias is created between the substrate holder and barrier plate to deposit material onto the substrate. (See Figure 1 and col.

11, lines 22-28). Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn

The rejection of claims 22-28 under 35 U.S.C. 103(a) as being unpatentable over JP 9-153669 (hereinafter "JP '669") in view of JP 4-135667 (hereinafter "JP '667") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The features of independent claim 22 are discussed above. Claims 23-28 depend therefrom.

The JP '669 reference discloses a coating application process in which a high voltage is applied between a nozzle and electrode base to electrically charge coating material as it is applied.

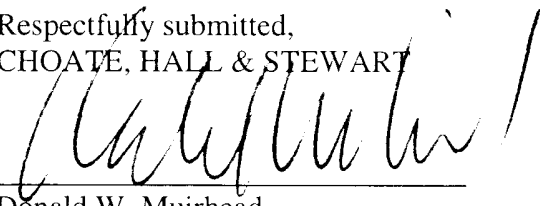
The JP '667 reference discloses a spin coating process in which electrodes embedded in a nozzle and substrate holding chuck are used to apply a voltage between the nozzle and chuck. The electrode in the chuck faces a central region of the electrode in the nozzle so that an electric field is formed which has an increased intensity in the central region of the substrate.

Applicant respectfully submits that neither JP '669 nor JP '667, taken alone or in any combination, teach or fairly suggest that an electric field is generated circumferentially around the semiconductor substrate *by at least one electrode positioned circumferentially around said*

semiconductor substrate, and wherein the at least one electrode is rotatable about said center of said semiconductor substrate separately from rotation of the semiconductor substrate, as is claimed by Applicant. Specifically, the Office Action cites JP '667 as teaching the rotation of a spin table and combines the teachings of this reference with the circular electrode configuration disclosed in JP '669. However, neither of these references discloses the rotatable nature of circumferentially positioned electrodes that are separately rotatable about the center of the semiconductor substrate separately from the rotation of the semiconductor substrate on a rotary table. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Based on the above, Applicants respectfully request that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 617-248-4038.

Respectfully submitted,
CHOATE, HALL & STEWART


Donald W. Muirhead
Registration No. 33,978

Date: September 8, 2003

Choate, Hall & Stewart
Exchange Place
53 State Street
Boston, MA 02109
Phone: (617) 248-5000
Fax: (617) 248-4000